



## PATENT ABSTRACTS OF JAPAN

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(21) Application number: **09071222**(22) Date of filing: **25.03.1997**(71) Applicant: **TOSHIBA CORP**(72) Inventor: **MIYAKE KAZUYUKI****(54) ACTIVE MATRIX TYPE LIQUID CRYSTAL DISPLAY DEVICE****(57) Abstract:**

**PROBLEM TO BE SOLVED:** To obtain excellent coordinate information without spoiling an image display function or increasing the power consumption and further to make the device thin and lightweight by sending and receiving an electromagnetic wave directly between an input pen and a coordinate detection electrode.

**SOLUTION:** The surface of the liquid crystal display element 8 on the side of the opposite substrate is scanned with the input pen, the input pen is caused to resonate with an electromagnetic field produced by the looped antenna coil of 1st and 2nd coordinate detection electrodes 7a and 7b, and the produced electromagnetic wave is received by the antenna coil. This electromagnetic wave sending and receiving operation is repeated while antenna coils are switched, and the 1st and 2nd coordinate detection electrodes 7a and 7b

receive the electromagnetic wave from the input pen to detect coordinates. The detection result is outputted from 1st and 2nd coordinate detection terminals to a coordinate detection signal controller and a coordinate detecting process circuit processes it into coordinate information and inputs it to a control unit such as a computer.

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